

## Complex Revision Total Hip Arthroplasty for Periprosthetic Acetabulum Fractures

► Orthopaedic surgeons at Penn Medicine are taking a multidisciplinary approach to the treatment of periprosthetic acetabulum fractures associated with total hip arthroplasty (THA).

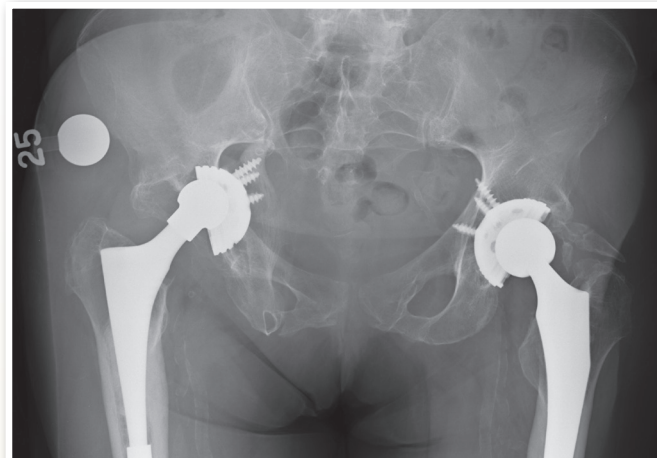
Periprosthetic acetabulum fractures present a rare complication distinguished by their challenges for both surgeons and the patient population. These fractures, which involve the socket of the hipbone, can occur intraoperatively or in the post-operative period and are associated with a number of complications, including hip osteonecrosis, non-union and implant loosening.

Reduction and fixation of periprosthetic acetabulum fractures is a complex undertaking because pre-existing implants can obstruct reduction and proper placement of fixation devices. Pelvic discontinuity in particular can be challenging to manage. More often seen in women and patients with inflammatory arthritis, pelvic discontinuity occurs in the setting of both THA and hemiarthroplasty. Vertical migration of the femoral component is common. Discontinuities can occur intra-operatively or post-operatively.

Expertise in both fracture management and joint reconstruction is often necessary to provide the best care and outcomes for patients requiring THA revision in the setting of periprosthetic acetabulum fractures.

At Penn Medicine, these surgeries are routinely performed as a team approach utilizing the skill sets of a fellowship trained orthopaedic traumatologist and a fellowship trained adult reconstructive surgeon. Because managing THA-associated periprosthetic acetabulum fractures requires expertise in both fracture management and joint reconstruction, this combined effort allows for the best possible outcomes.

The treatment of intra-operative periprosthetic acetabulum fractures at Penn consists of leaving the cup in place if it is stable, revising it to a multi-hole cup, bone grafting behind the cup, and/or posterior column plating if the cup is unstable. Fractures that occur after THA are typically due to component migration secondary to osteolysis, loss of cup fixation and fracture. Treatment of these late causes at Penn involves revision to a jumbo cup, posterior column plating, the use of modular augments or use of a custom tri-flange component.



► Figure 1: AP pelvis of right hip demonstrating periprosthetic acetabulum fracture.

### Case Study

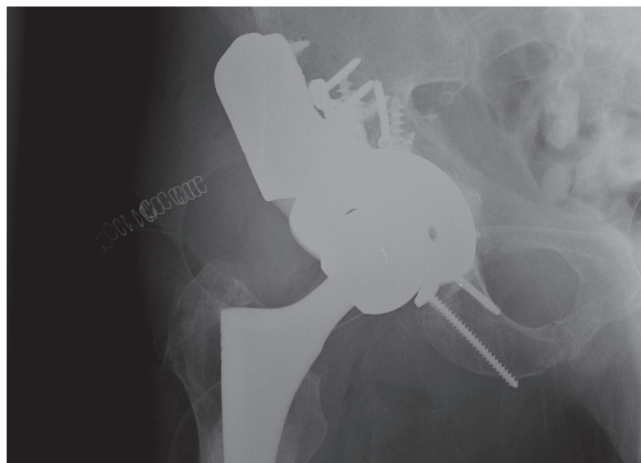
At age 53, Mrs. L came to Penn Orthopaedics with a long-standing history of Lupus and steroid use and a right-sided THA of approximately 10 years duration. Following a slip and fall injury, she was diagnosed at an outside hospital ER with a right periprosthetic acetabulum fracture (Figure 1) and transferred to Penn Orthopaedics for definitive management. A combined approach was planned to address the complexity of her injury.

Surgery to Mrs. L's hip was approached through the previously placed THA incision extending more posteriorly towards the posterior superior iliac spine to perform a formal Kocker-Langenbeck procedure. Once the exposure was complete, the hip was dislocated and the acetabulum exposed. The acetabular component was removed, and the acetabular fracture fully exposed and debrided. The posterior column fracture was then reduced and transfixed with an independent 3.5mm lag screw and an 8-hole 3.5mm reconstruction plate.

With the posterior column fixed, the THA revision was initiated. The acetabulum was revised using a large trabecular metal cup with a posterior column trabecular metal augment secured into the ilium and cemented to the cup for unitization. Both the cup and augment were secured with multiple screws. At completion of the acetabulum, the femoral component was evaluated and deemed stable with appropriate anteversion. The hip was then reduced with trial components and excellent stability achieved. The final components were placed and the wound was irrigated thoroughly and closed in typical layered fashion (Figure 2).

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(Case Study continued)



► **Figure 2:** AP right hip demonstrating revision THA with posterior column plate, revision cup and buttress augment.

Post-operatively, Mrs. L was given posterior hip precautions and permitted touchdown weight bearing for a total of six weeks, at which point she was progressed to 50% weight bearing. At three months, weight bearing as tolerated was permitted.

Mrs. L is currently six months out from surgery and is fully weight bearing with minimal pain in her right hip. Recent x-rays demonstrate that the acetabular fracture is both well-fixed and healed (Figure 3).



► **Figure 3:** Six-month post-op image demonstrating well-fixed THA with healed acetabular fracture.



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## Faculty Team

The nation's first department of orthopaedic surgery and a national leader in National Institutes of Health (NIH) funding, Penn Orthopaedics offers advanced, personally-tailored care and the latest treatment options for a variety of injuries and disorders within ten orthopaedic subspecialties. Penn Orthopaedics is committed to pre-eminent orthopaedic surgery, clinical research and excellence in the education of orthopaedic surgeons.

### Performing THA Revision Surgery for Periprosthetic Acetabulum Fractures at Penn Medicine

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